

SAFE ROADS APP

BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING)

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Introduction

With the growing number of vehicles on the road and the increasing frequency of accidents, modern cities face immense challenges in maintaining road safety and ensuring smooth traffic flow. In response to these challenges, **Safe Roads** is developed as an intelligent traffic and accident management system that utilizes real-time data, AI, and intuitive design to enhance urban mobility and safety.

The **Safe Roads** Android application offers a comprehensive set of features to assist both commuters and authorities in navigating traffic and responding to road incidents efficiently. Users can access **Traffic Updates** by simply entering a location, enabling them to view congestion levels and plan their travel accordingly. The **Navigation** feature allows users to input their source and destination to receive the best possible route with minimal traffic, promoting time-efficient and stress-free travel.

To support road safety and rapid incident response, the app includes an **Accident Reporting** module where users can provide details such as the date, time, and location of an accident. These reports are then made available through the **Incident Reports** section, helping others stay informed about recent road incidents. Additionally, the **Road Safety Measures** section features visually engaging infographics that educate users on essential safety practices and guidelines.

In emergencies, quick access to help is crucial. The app's **Emergency Contacts** feature consolidates all key service numbers—such as police, ambulance, and fire services—and allows users to initiate a call directly through the dial pad with a single tap.

Safe Roads aims to combine smart features with practical usability to make roads safer, traffic smarter, and help more accessible—ultimately contributing to a more secure and efficient urban transport environment.

Code and Working Snapshots

1. Login Page

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="24dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center">

    <ImageView
```

```
    android:layout_width="232dp"
    android:layout_height="225dp"
    android:layout_centerInParent="true"
    android:src="@drawable/splash"
    android:contentDescription="null"/>

<EditText
    android:id="@+id/username"
    android:hint="Username"
    android:layout_width="320dp"
    android:layout_height="48dp"/>

<EditText
    android:id="@+id/password"
    android:hint="Password"
    android:inputType="textPassword"
    android:layout_width="320dp"
    android:layout_height="48dp"/>

<Button
    android:id="@+id/loginButton"
    android:text="Login"
    android:layout_width="310dp"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"/>

<Button
    android:id="@+id/signupRedirect"
    android:text="Go to Signup"
    android:layout_width="310dp"
    android:layout_height="wrap_content"
    android:layout_marginTop="8dp"/>
</LinearLayout>
```

Kt code for Login Page

```
package com.example.saferoads
```

```
import android.content.Intent
import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity
```

```

class LoginActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_login)

        val username = findViewById<EditText>(R.id.username)
        val password = findViewById<EditText>(R.id.password)
        val loginButton = findViewById<Button>(R.id.loginButton)
        val signupRedirect = findViewById<Button>(R.id.signupRedirect)

        loginButton.setOnClickListener {
            val user = username.text.toString()
            val pass = password.text.toString()

            if (SharedPrefHelper.isValidUser(this, user, pass)) {
                Toast.makeText(this, "Login successful",
                Toast.LENGTH_SHORT).show()
                startActivity(Intent(this, DashboardActivity::class.java))
                finish()
            } else {
                Toast.makeText(this, "Invalid username or password",
                Toast.LENGTH_SHORT).show()
            }
        }

        signupRedirect.setOnClickListener {
            startActivity(Intent(this, SignupActivity::class.java))
        }
    }
}

```

2. Sign up activity code

Xml code

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="24dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center">

    <ImageView
        android:layout_width="232dp"
        android:layout_height="225dp"

```

```
    android:layout_centerInParent="true"
    android:src="@drawable/splash"
    android:contentDescription="App Logo" />

<EditText
    android:id="@+id/username"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="16dp"
    android:background="@android:drawable/edit_text"
    android:hint="Username"
    android:textColorHint="#757575" />

<EditText
    android:id="@+id/email"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="12dp"
    android:background="@android:drawable/edit_text"
    android:hint="Email"
    android:inputType="textEmailAddress"
    android:textColorHint="#757575" />

<EditText
    android:id="@+id/phone"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="12dp"
    android:background="@android:drawable/edit_text"
    android:hint="Phone Number"
    android:inputType="phone"
    android:textColorHint="#757575" />

<EditText
    android:id="@+id/address"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="12dp"
    android:background="@android:drawable/edit_text"
    android:hint="Address"
    android:textColorHint="#757575" />
```

```
<EditText
    android:id="@+id/password"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="12dp"
    android:background="@android:drawable/edit_text"
    android:hint="Password"
    android:inputType="textPassword"
    android:textColorHint="#757575" />

<EditText
    android:id="@+id/confirmPassword"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:layout_marginTop="12dp"
    android:background="@android:drawable/edit_text"
    android:hint="Confirm Password"
    android:inputType="textPassword"
    android:textColorHint="#757575" />

<Button
    android:id="@+id/signupButton"
    android:text="Sign Up"
    android:layout_width="320dp"
    android:layout_height="wrap_content"
    android:layout_marginTop="24dp"
    android:backgroundTint="@color/blue"
    android:textColor="@android:color/white"/>
</LinearLayout>
```

Kt code for signup activity

```
package com.example.saferoads
```

```
import android.content.Intent
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity

class SignupActivity : AppCompatActivity() {
```

```
override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_signup)

    val username = findViewById<EditText>(R.id.username)
    val email = findViewById<EditText>(R.id.email)
    val phone = findViewById<EditText>(R.id.phone)
    val address = findViewById<EditText>(R.id.address)
    val password = findViewById<EditText>(R.id.password)
    val confirmPassword = findViewById<EditText>(R.id.confirmPassword)
    val signupButton = findViewById<Button>(R.id.signupButton)

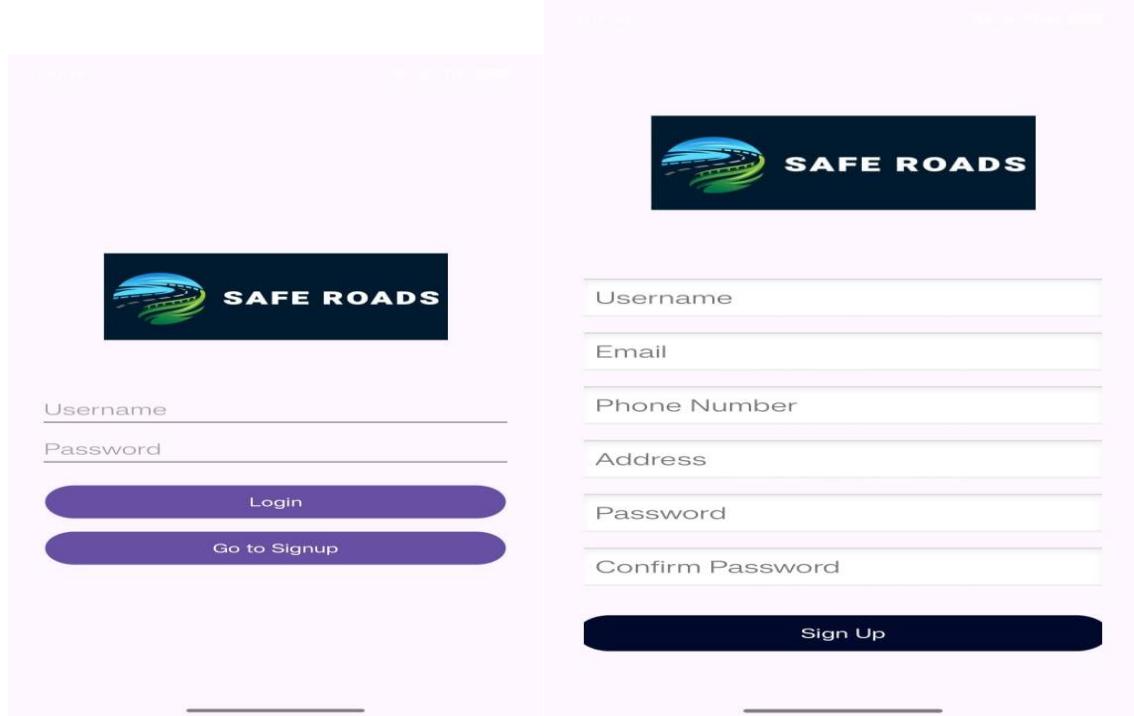
    signupButton.setOnClickListener {
        val user = username.text.toString()
        val userEmail = email.text.toString()
        val userPhone = phone.text.toString()
        val userAddress = address.text.toString()
        val pass = password.text.toString()
        val confirmPass = confirmPassword.text.toString()

        if (user.isNotEmpty() && userEmail.isNotEmpty() &&
            userPhone.isNotEmpty() &&
            userAddress.isNotEmpty() && pass.isNotEmpty() && pass ==
            confirmPass) {

            // Save the user details in SharedPreferences
            SharedPrefHelper.saveUser(this, user, userEmail, userPhone,
            userAddress, pass)

            Toast.makeText(this, "Signup successful",
            Toast.LENGTH_SHORT).show()
            startActivity(Intent(this, LoginActivity::class.java))
            finish()
        } else {
            Toast.makeText(this, "Please fill all fields correctly",
            Toast.LENGTH_SHORT).show()
        }
    }
}
```

Working snapshots



3. Dashboard activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <!-- Toolbar with app icon and menu -->
    <androidx.appcompat.widget.Toolbar
        android:layout_marginTop="30dp"
        android:id="@+id/dashboardToolbar"
        android:layout_width="match_parent"
        android:layout_height="?attr actionBarSize"
        android:background="@color/blue"
        android:theme="@style/ThemeOverlay.AppCompat.Dark.ActionBar"
        android:popupTheme="@style/ThemeOverlay.AppCompat.Light"
        app:title=""
        app:contentInsetStart="0dp"
        android:paddingStart="0dp"
        android:paddingEnd="0dp">

        <!-- Custom layout inside toolbar -->
        <LinearLayout
```

```

        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="horizontal"
        android:gravity="center_vertical"
        android:paddingStart="12dp"
        android:paddingEnd="12dp">

    <ImageView
        android:id="@+id/toolbar_logo"
        android:layout_width="150dp"
        android:layout_height="64dp"
        android:layout_gravity="center_vertical"
        android:contentDescription="App Logo"
        android:src="@drawable/splash" />

</LinearLayout>
</androidx.appcompat.widget.Toolbar>

<!-- Fragment container for Home/Driving Tests -->
<FrameLayout
    android:id="@+id/fragment_container"
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1" />
</LinearLayout>
```

Kt code for dashboard activity

```
package com.example.saferoads
```

```

import android.os.Bundle
import android.view.Menu
import android.view.MenuItem
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import androidx.appcompat.widget.Toolbar

class DashboardActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_dashboard)
```

```

val toolbar = findViewById<Toolbar>(R.id.dashboardToolbar)
setSupportActionBar(toolbar)
supportActionBar?.setDisplayShowTitleEnabled(false)

// Set default fragment as HomeFragment
val homeFragment = HomeFragment()
supportFragmentManager.beginTransaction()
    .replace(R.id.fragment_container, homeFragment)
    .commit()
}

}

```

In Dashboard Activity inside we created a fragment called HomeFragment

4. Home fragment code

Xml code

```

<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:paddingBottom="50dp">

        <!-- GridLayout for all main content -->
        <GridLayout
            android:layout_marginTop="50dp"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:columnCount="2"
            android:rowCount="3"
            android:alignmentMode="alignMargins"
            android:rowOrderPreserved="false"
            android:useDefaultMargins="true">

```

```
<!-- Accident Reporting -->
<ImageView
    android:id="@+id/accidentImageView"
    android:layout_marginTop="20dp"
    android:layout_width="164dp"
    android:layout_height="154dp"
    android:layout_gravity="center"
    android:contentDescription="Accident Reporting"
    android:src="@drawable/ic_accident" />

<!-- Navigation -->
<ImageView
    android:id="@+id/imageNavigation"
    android:layout_marginTop="20dp"
    android:layout_width="164dp"
    android:layout_height="154dp"
    android:layout_gravity="center"
    android:src="@drawable/ic_navigation"
    android:contentDescription="Navigation" />

<!-- Traffic Updates -->
<ImageView
    android:id="@+id/imageViewTrafficUpdates"
    android:layout_marginTop="20dp"
    android:layout_width="164dp"
    android:layout_height="154dp"
    android:layout_gravity="center"
    android:contentDescription="Traffic Updates"
    android:src="@drawable/ic_traffic_updates" />

<!-- Road Safety (Replaced Fuel Calculator) -->
<ImageView
    android:id="@+id/imageViewRoadSafety"
    android:layout_marginTop="20dp"
    android:layout_width="164dp"
    android:layout_height="154dp"
    android:layout_gravity="center"
    android:src="@drawable/ic_road_safety"
    android:contentDescription="Road Safety"/>

<!-- Incidents Reported -->
<ImageView
```

```
        android:id="@+id/imageViewIncidentsReported"
        android:layout_marginTop="20dp"
        android:layout_width="164dp"
        android:layout_height="154dp"
        android:layout_gravity="center"
        android:src="@drawable/ic_incident"
        android:contentDescription="Incidents Reported" />

    <!-- Emergency Contacts -->
    <ImageView
        android:id="@+id/imageViewEmergencyContacts"
        android:layout_marginTop="20dp"
        android:layout_width="164dp"
        android:layout_height="154dp"
        android:layout_gravity="center"
        android:src="@drawable/ic_contacts"
        android:contentDescription="Emergency Contacts" />

</GridLayout>

<!-- Horizontal LinearLayout for Settings and Profile buttons at the bottom
-->
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:gravity="center"
    android:layout_marginTop="20dp">

    <!-- Spacing between buttons -->
    <View
        android:layout_width="8dp"
        android:layout_height="wrap_content" />

    <!-- Profile Button (Left Side) -->
    <Button
        android:id="@+id/btnProfile"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:text="Profile"
        android:layout_weight="1"
        android:layout_gravity="start"
```

```

        tools:ignore="VisualLintButtonSize" />

        <!-- Settings Button (Right Side) -->
        <Button
            android:id="@+id/btnSettings"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:text="Settings"
            android:layout_weight="1"
            android:layout_gravity="end"
            tools:ignore="VisualLintButtonSize" />

    </LinearLayout>
</LinearLayout>
</ScrollView>

```

Kt code for Home fragment

```
package com.example.saferoads
```

```

import android.content.Intent
import android.os.Bundle
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.Button
import android.widget.ImageView
import androidx.fragment.app.Fragment

class HomeFragment : Fragment() {

    override fun onCreateView(
        inflater: LayoutInflater, container: ViewGroup?,
        savedInstanceState: Bundle?
    ): View? {
        // Inflate the layout for this fragment
        val view = inflater.inflate(R.layout.fragment_home, container, false)

        // Handling click events for various sections

        // Accident Reporting Image Click
    }
}

```

```
val accidentImage = view.findViewById<ImageView>(R.id.accidentImageView)
accidentImage.setOnClickListener {
    val intent = Intent(requireContext(), AccidentReportActivity::class.java)
    startActivity(intent)
}

// Navigation Image Click
val navigationImage =
view.findViewById<ImageView>(R.id.imageNavigation)
navigationImage.setOnClickListener {
    val intent = Intent(requireContext(), NavigationActivity::class.java)
    startActivity(intent)
}

// Incidents Reported Image Click
val incidentImage =
view.findViewById<ImageView>(R.id.imageViewIncidentsReported)
incidentImage.setOnClickListener {
    val intent = Intent(requireContext(),
ReportedIncidentsActivity::class.java)
    startActivity(intent)
}

// Emergency Contacts Image Click
val emergencyContactsImage =
view.findViewById<ImageView>(R.id.imageViewEmergencyContacts)
emergencyContactsImage.setOnClickListener {
    val intent = Intent(requireContext(),
EmergencyContactsActivity::class.java)
    startActivity(intent)
}

// Road Safety Image Click (Newly Added)
val roadSafetyImage =
view.findViewById<ImageView>(R.id.imageViewRoadSafety)
roadSafetyImage.setOnClickListener {
    // Navigate to Road Safety Activity
    val intent = Intent(requireContext(), RoadSafetyActivity::class.java)
    startActivity(intent)
}

// Traffic Updates Image Click
```

```

    val trafficUpdatesImage =
view.findViewById<ImageView>(R.id.imageViewTrafficUpdates)
    trafficUpdatesImage.setOnClickListener {
        val intent = Intent(requireContext(), TrafficUpdatesActivity::class.java)
        startActivity(intent)
    }

    // Profile Button Click
    val btnProfile: Button = view.findViewById(R.id.btnProfile)
    btnProfile.setOnClickListener {
        // Navigate to Profile Activity
        val intent = Intent(requireContext(), ProfileActivity::class.java)
        startActivity(intent)
    }

    // Settings Button Click
    val btnSettings: Button = view.findViewById(R.id.btnSettings)
    btnSettings.setOnClickListener {
        // Navigate to Settings Activity
        val intent = Intent(requireContext(), SettingsActivity::class.java)
        startActivity(intent)
    }

    return view
}
}

```

Working snapshot



5. Accident reporting activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.coordinatorlayout.widget.CoordinatorLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginTop="20dp">

    <!-- Toolbar at top -->
    <androidx.appcompat.widget.Toolbar
        android:layout_marginTop="15dp"
        android:id="@+id/dashboardToolbar"
        android:layout_width="match_parent"
        android:layout_height="?attr actionBarSize"
        android:background="@color/blue"
        android:theme="@style/ThemeOverlay.AppCompat.Dark.ActionBar"
        android:popupTheme="@style/ThemeOverlay.AppCompat.Light"
        app:title=""
        app:contentInsetStart="0dp"
        android:paddingStart="0dp"
        android:paddingEnd="0dp">

        <!-- Custom layout inside toolbar -->
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="horizontal"
            android:gravity="center_vertical"
            android:paddingStart="12dp"
            android:paddingEnd="12dp">

            <ImageView
                android:id="@+id/toolbar_logo"
                android:layout_width="179dp"
                android:layout_height="59dp"
                android:layout_gravity="center_vertical"
                android:contentDescription="App Logo"
                android:src="@drawable/splash" />

```

```
</LinearLayout>
</androidx.appcompat.widget.Toolbar>

<!-- Main content scrollable -->
<ScrollView

    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginTop="?attr/actionBarSize"
    android:padding="20dp"
    android:background="@color/white">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">

        <!-- Date -->
        <EditText
            android:layout_marginTop="20dp"
            android:id="@+id/editDate"
            android:inputType="date"
            android:layout_width="370dp"
            android:layout_height="wrap_content"
            android:hint="Select Date"
            android:focusable="false"
            android:drawableEnd="@android:drawable/ic_menu_today"
            android:padding="12dp"
            android:background="@drawable/edittext_background"
            android:textSize="16sp" />

        <!-- Time -->
        <EditText
            android:id="@+id/editTime"
            android:layout_width="370dp"
            android:layout_height="wrap_content"
            android:hint="Select Time"
            android:focusable="false"
            android:drawableEnd="@android:drawable/ic_menu_recent_history"
            android:padding="12dp"
            android:background="@drawable/edittext_background"
            android:textSize="16sp"
```

```
        android:inputType="time"
        android:layout_marginTop="12dp" />

    <!-- Place -->
    <EditText
        android:id="@+id/editPlace"
        android:layout_width="370dp"
        android:layout_height="48dp"
        android:hint="Place of Accident"
        android:padding="12dp"
        android:background="@drawable/edittext_background"
        android:textSize="16sp"
        android:layout_marginTop="12dp" />

    <!-- Injuries -->
    <EditText
        android:id="@+id/editInjuries"
        android:layout_width="370dp"
        android:layout_height="wrap_content"
        android:hint="Group Injuries by Type, Cause, Body Part Affected"
        android:minLines="3"
        android:gravity="top"
        android:padding="12dp"
        android:background="@drawable/edittext_background"
        android:textSize="16sp"
        android:layout_marginTop="12dp" />

    <!-- Save Button -->
    <Button
        android:layout_gravity="center"
        android:id="@+id/btnSave"
        android:layout_width="320dp"
        android:layout_height="wrap_content"
        android:text="Save Report"
        android:layout_marginTop="20dp" />
</LinearLayout>
</ScrollView>

</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

Kt code for Accident reporting activity

```
package com.example.saferoads
```

```
import android.app.DatePickerDialog
import android.app.TimePickerDialog
import android.content.Context
import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity
import org.json.JSONArray
import org.json.JSONObject
import java.util.*
```

```
class AccidentReportActivity : AppCompatActivity() {
```

```
    private lateinit var editDate: EditText
    private lateinit var editTime: EditText
    private lateinit var editPlace: EditText
    private lateinit var editInjuries: EditText
    private lateinit var btnSave: Button
```

```
    companion object {
        private const val PREFS_NAME = "AccidentPrefs"
    }
```

```
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_accident_report)
        val toolbar =
            findViewById<androidx.appcompat.widget.Toolbar>(R.id.dashboardToolbar)
        setSupportActionBar(toolbar)
```

```
        // Initialize views
        editDate = findViewById(R.id.editDate)
        editTime = findViewById(R.id.editTime)
        editPlace = findViewById(R.id.editPlace)
        editInjuries = findViewById(R.id.editInjuries)
        btnSave = findViewById(R.id.btnSave)
```

```
        // Listeners
        editDate.setOnClickListener { showDatePicker() }
```

```
editTime.setOnClickListener { showTimePicker() }
btnSave.setOnClickListener { saveReport() }
}

private fun showDatePicker() {
    val calendar = Calendar.getInstance()
    val datePickerDialog = DatePickerDialog(
        this,
        { _, year, month, dayOfMonth ->
            val selectedDate = "$dayOfMonth/${month + 1}/$year"
            editDate.setText(selectedDate)
        },
        calendar.get(Calendar.YEAR),
        calendar.get(Calendar.MONTH),
        calendar.get(Calendar.DAY_OF_MONTH)
    )
    datePickerDialog.show()
}

private fun showTimePicker() {
    val calendar = Calendar.getInstance()
    val timePickerDialog = TimePickerDialog(
        this,
        { _, hourOfDay, minute ->
            val selectedTime = String.format("%02d:%02d", hourOfDay, minute)
            editTime.setText(selectedTime)
        },
        calendar.get(Calendar.HOUR_OF_DAY),
        calendar.get(Calendar.MINUTE),
        true
    )
    timePickerDialog.show()
}

private fun saveReport() {
    val date = editDate.text.toString()
    val time = editTime.text.toString()
    val place = editPlace.text.toString()
    val injuries = editInjuries.text.toString()

    // Create the JSON object for the new report
    val report = JSONObject().apply {
```

```

        put("date", date)
        put("time", time)
        put("place", place)
        put("injuries", injuries)
        put("imageUri", "") // No image URI as the image upload is removed
    }

    // Get the current list of reports from SharedPreferences
    val sharedPrefs = getSharedPreferences(PREFS_NAME,
    Context.MODE_PRIVATE)
    val existingReports = sharedPrefs.getString("report_list", "[]")
    val reportList = JSONArray(existingReports)

    // Add the new report to the list
    reportList.put(report)

    // Save the updated list back to SharedPreferences
    sharedPrefs.edit().putString("report_list", reportList.toString()).apply()

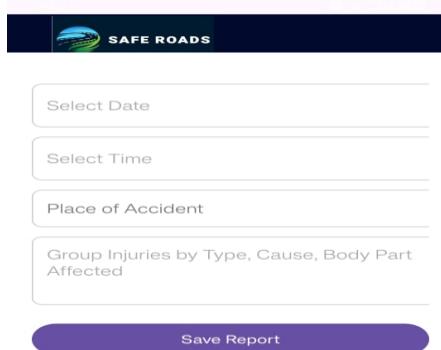
    // Show a message that the report has been saved
    Toast.makeText(this, "Accident report saved",
    Toast.LENGTH_SHORT).show()

    // Close the activity after saving
    finish()
}

}

```

Working Snapshot



6. Navigation Activity

Xml code

```
package com.example.saferoads

import android.Manifest
import android.content.Intent
import android.content.pm.PackageManager
import android.location.Location
import android.os.Bundle
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import androidx.core.app.ActivityCompat
import androidx.core.content.ContextCompat
import androidx.core.net.toUri
import com.google.android.gms.location.FusedLocationProviderClient
import com.google.android.gms.location.LocationServices

class NavigationActivity : AppCompatActivity() {

    private lateinit var fusedLocationClient: FusedLocationProviderClient

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_navigation) // Simple layout

        fusedLocationClient =
            LocationServices.getFusedLocationProviderClient(this)

        // Explicitly check for permission
        if (ContextCompat.checkSelfPermission(this,
            Manifest.permission.ACCESS_FINE_LOCATION)
            != PackageManager.PERMISSION_GRANTED) {

            ActivityCompat.requestPermissions(
                this,
                arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
                1001
            )
        } else {
            // Permission is already granted, get the last known location
            getLastLocation()
        }
    }
}
```

```

}

private fun getLastLocation() {
    // Explicitly check permission before accessing location
    if (ContextCompat.checkSelfPermission(this,
        Manifest.permission.ACCESS_FINE_LOCATION)
        == PackageManager.PERMISSION_GRANTED) {
        try {
            fusedLocationClient.lastLocation.addOnSuccessListener { location:
                Location? ->
                if (location != null) {
                    openGoogleMaps(location.latitude, location.longitude)
                } else {
                    Toast.makeText(this, "Unable to get current location",
                        Toast.LENGTH_SHORT).show()
                    finish()
                }
            }.addOnFailureListener {
                Toast.makeText(this, "Error retrieving location.",
                    Toast.LENGTH_SHORT).show()
            }
        } catch (e: SecurityException) {
            // Catch and handle any SecurityException
            Toast.makeText(this, "Permission denied: Unable to access
            location.", Toast.LENGTH_SHORT).show()
        }
    } else {
        // Request permission if not granted
        ActivityCompat.requestPermissions(
            this,
            arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
            1001
        )
    }
}

private fun openGoogleMaps(currentLat: Double, currentLng: Double) {
    val destinationLat = 12.9716 // Replace with your destination latitude
    val destinationLng = 77.5946 // Replace with your destination longitude

    val uri = ("https://www.google.com/maps/dir/?api=1" +
        "&origin=$currentLat,$currentLng" +

```

```

"&destination=$destinationLat,$destinationLng" +
"&travelmode=driving&dir_action=navigate").toUri()

val mapIntent = Intent(Intent.ACTION_VIEW, uri)
mapIntent.setPackage("com.google.android.apps.maps")

if (mapIntent.resolveActivity(packageManager) != null) {
    startActivity(mapIntent)
} else {
    Toast.makeText(this, "Google Maps is not installed!",
    Toast.LENGTH_LONG).show()
}

finish()
}

// Handle the result of permission request
override fun onRequestPermissionsResult(requestCode: Int, permissions:
Array<out String>, grantResults: IntArray) {
    super.onRequestPermissionsResult(requestCode, permissions,
    grantResults)

    if (requestCode == 1001) {
        if (grantResults.isNotEmpty() && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
            // Permission granted, proceed with getting the location
            getLastLocation()
        } else {
            // Permission denied
            Toast.makeText(this, "Permission denied. Cannot access location.",
            Toast.LENGTH_SHORT).show()
            finish()
        }
    }
}

```

Kt code for NavigationActivity

package com.example.saferoads

```

import android.Manifest
import android.content.Intent

```

```
import android.content.pm.PackageManager
import android.location.Location
import android.os.Bundle
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import androidx.core.app.ActivityCompat
import androidx.core.content.ContextCompat
import androidx.core.net.toUri
import com.google.android.gms.location.FusedLocationProviderClient
import com.google.android.gms.location.LocationServices

class NavigationActivity : AppCompatActivity() {

    private lateinit var fusedLocationClient: FusedLocationProviderClient

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_navigation) // Simple layout

        fusedLocationClient =
            LocationServices.getFusedLocationProviderClient(this)

        // Explicitly check for permission
        if (ContextCompat.checkSelfPermission(this,
            Manifest.permission.ACCESS_FINE_LOCATION)
            != PackageManager.PERMISSION_GRANTED) {

            ActivityCompat.requestPermissions(
                this,
                arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
                1001
            )
        } else {
            // Permission is already granted, get the last known location
            getLastLocation()
        }
    }

    private fun getLastLocation() {
        // Explicitly check permission before accessing location
        if (ContextCompat.checkSelfPermission(this,
            Manifest.permission.ACCESS_FINE_LOCATION)
```

```

== PackageManager.PERMISSION_GRANTED) {
    try {
        fusedLocationClient.lastLocation.addOnSuccessListener { location:
Location? ->
            if (location != null) {
                openGoogleMaps(location.latitude, location.longitude)
            } else {
                Toast.makeText(this, "Unable to get current location",
Toast.LENGTH_SHORT).show()
                finish()
            }
        }.addOnFailureListener {
            Toast.makeText(this, "Error retrieving location.",
Toast.LENGTH_SHORT).show()
        }
    } catch (e: SecurityException) {
        // Catch and handle any SecurityException
        Toast.makeText(this, "Permission denied: Unable to access
location.", Toast.LENGTH_SHORT).show()
    }
} else {
    // Request permission if not granted
    ActivityCompat.requestPermissions(
        this,
        arrayOf(Manifest.permission.ACCESS_FINE_LOCATION),
        1001
    )
}
}

private fun openGoogleMaps(currentLat: Double, currentLng: Double) {
    val destinationLat = 12.9716 // Replace with your destination latitude
    val destinationLng = 77.5946 // Replace with your destination longitude

    val uri = ("https://www.google.com/maps/dir/?api=1" +
        "&origin=$currentLat,$currentLng" +
        "&destination=$destinationLat,$destinationLng" +
        "&travelmode=driving&dir_action=navigate").toUri()

    val mapIntent = Intent(Intent.ACTION_VIEW, uri)
    mapIntent.setPackage("com.google.android.apps.maps")
}

```

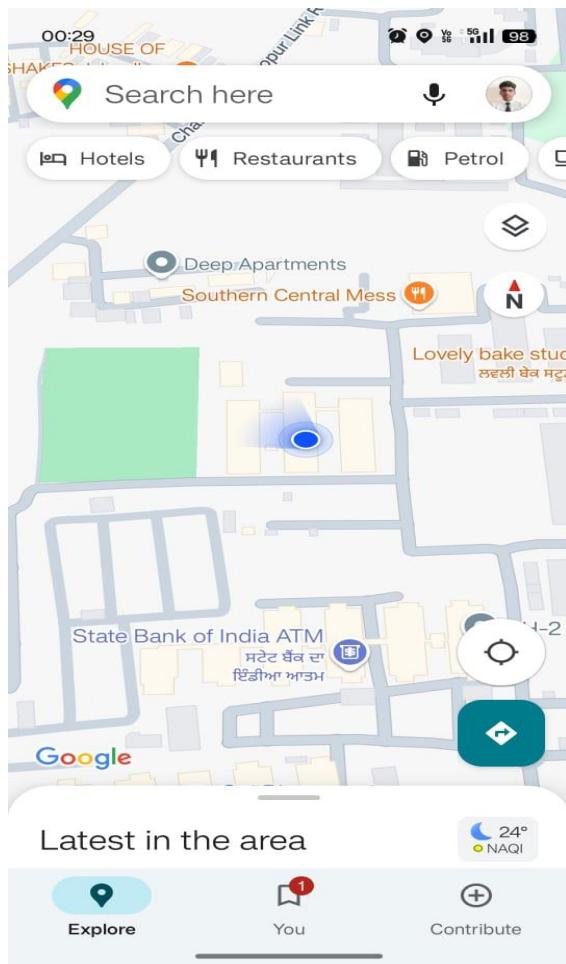
```
        if (mapIntent.resolveActivity(packageManager) != null) {
            startActivity(mapIntent)
        } else {
            Toast.makeText(this, "Google Maps is not installed!",
Toast.LENGTH_LONG).show()
        }

        finish()
    }

// Handle the result of permission request
override fun onRequestPermissionsResult(requestCode: Int, permissions:
Array<out String>, grantResults: IntArray) {
    super.onRequestPermissionsResult(requestCode, permissions,
grantResults)

    if (requestCode == 1001) {
        if (grantResults.isNotEmpty() && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
            // Permission granted, proceed with getting the location
            getLastLocation()
        } else {
            // Permission denied
            Toast.makeText(this, "Permission denied. Cannot access location.",
Toast.LENGTH_SHORT).show()
            finish()
        }
    }
}
```

Working snapshot



7. TrafficUpdates Activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

    <EditText
        android:layout_marginTop="30dp"
        android:inputType="text"
        android:id="@+id/locationEditText"
        android:layout_width="320dp"
        android:layout_gravity="center"
        android:layout_height="50dp"
        android:hint="Enter location (e.g., Delhi)" />
```

```
<Button  
    android:id="@+id/checkTrafficButton"  
    android:layout_width="320dp"  
    android:layout_gravity="center"  
    android:layout_height="wrap_content"  
    android:text="Check Traffic" />  
  
<WebView  
    android:id="@+id/webView"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent" />  
</LinearLayout>
```

Kt code for TrafficUpdates Activity

```
package com.example.saferoads  
  
import android.annotation.SuppressLint  
import android.os.Bundle  
import android.webkit.WebView  
import android.webkit.WebViewClient  
import android.widget.Button  
import android.widget.EditText  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity  
  
class TrafficUpdatesActivity : AppCompatActivity() {  
  
    private lateinit var webView: WebView  
    private lateinit var locationEditText: EditText  
    private lateinit var checkTrafficButton: Button  
  
    @Suppress("MissingInflatedId")  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.activity_traffic_updates)  
  
        webView = findViewById(R.id.webView)  
        locationEditText = findViewById(R.id.locationEditText)  
        checkTrafficButton = findViewById(R.id.checkTrafficButton)  
  
        // Enable JavaScript for interactive maps
```

```

webView.settings.javaScriptEnabled = true
webView.webViewClient = WebViewClient()

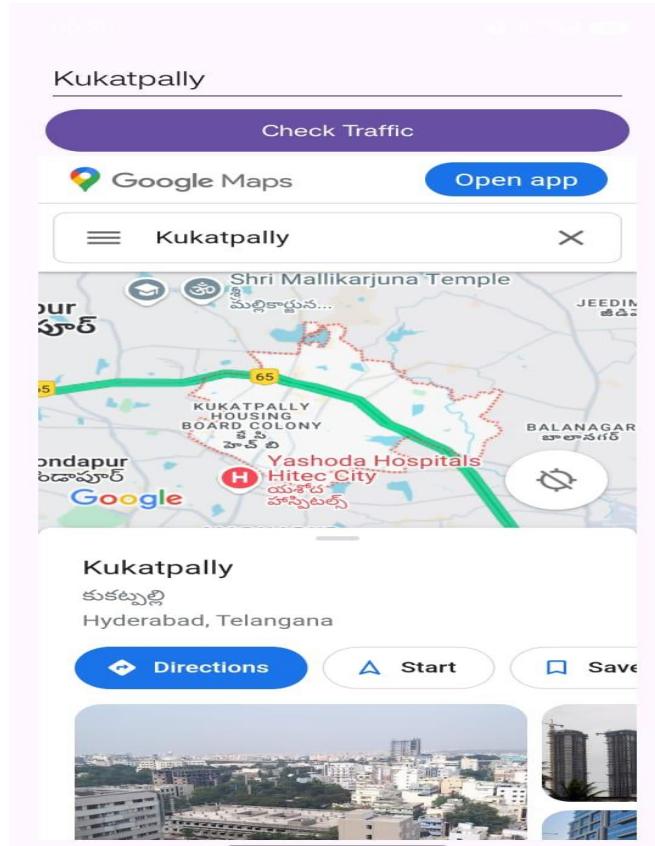
checkTrafficButton.setOnClickListener {
    val location = locationEditText.text.toString().trim()

    if (location.isEmpty()) {
        Toast.makeText(this, "Please enter a location!",
        Toast.LENGTH_SHORT).show()
    } else {
        showTrafficInWebView(location)
    }
}

private fun showTrafficInWebView(location: String) {
    val googleMapsUrl =
    "https://www.google.com/maps/search/?api=1&query=$location&layer=t"
    webView.loadUrl(googleMapsUrl)
}

```

Working snapshot



8. Road Safety Activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">

        <!-- Title -->
        <TextView
            android:layout_marginTop="30dp"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Road Safety Measures"
            android:textSize="22sp"
            android:textStyle="bold"
            android:paddingBottom="12dp" />

        <!-- Infographic Images -->
        <ImageView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:adjustViewBounds="true"
            android:scaleType="fitCenter"
            android:src="@drawable/safety1"
            android:contentDescription="Road safety measure infographic 1"
            android:layout_marginBottom="12dp" />

        <ImageView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:adjustViewBounds="true"
            android:scaleType="fitCenter"
            android:src="@drawable/safety2"
            android:contentDescription="Road safety measure infographic 2"
            android:layout_marginBottom="12dp" />
```

```
<ImageView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:adjustViewBounds="true"
    android:scaleType="fitCenter"
    android:src="@drawable/safety3"
    android:contentDescription="Road safety measure infographic 3"
    android:layout_marginBottom="12dp" />
```

```
<ImageView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:adjustViewBounds="true"
    android:scaleType="fitCenter"
    android:src="@drawable/safety4"
    android:contentDescription="Road safety measure infographic 4"
    android:layout_marginBottom="12dp" />
```

```
<ImageView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="12dp"
    android:adjustViewBounds="true"
    android:scaleType="fitCenter"
    android:src="@drawable/safety5"
    android:contentDescription="Road safety measure infographic 5" />
```

```
<ImageView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:adjustViewBounds="true"
    android:scaleType="fitCenter"
    android:src="@drawable/safety6"
    android:contentDescription="Road safety measure infographic 6"
    android:layout_marginBottom="12dp" />
```

```
<ImageView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:adjustViewBounds="true"
    android:scaleType="fitCenter"
    android:src="@drawable/safety7"
```

```
    android:contentDescription="Road safety measure infographic 7"  
    android:layout_marginBottom="12dp" />
```

```
<ImageView  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:adjustViewBounds="true"  
    android:scaleType="fitCenter"  
    android:src="@drawable/safety8"  
    android:contentDescription="Road safety measure infographic 8"  
    android:layout_marginBottom="12dp" />
```

```
<ImageView  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:adjustViewBounds="true"  
    android:scaleType="fitCenter"  
    android:src="@drawable/safety9"  
    android:contentDescription="Road safety measure infographic 9"  
    android:layout_marginBottom="12dp" />
```

```
<!-- Summary Text -->  
<TextView  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:text="• Always wear a seatbelt\n• Follow traffic signals\n•  
Don't use phones while driving\n• Maintain safe distances\n• Use pedestrian  
crossings"  
    android:textSize="16sp"  
    android:lineSpacingExtra="6dp"  
    android:layout_marginTop="12dp" />  
  
</LinearLayout>  
</ScrollView>
```

Kt code of Road Safety activity

```
package com.example.saferoads
```

```
import android.os.Bundle  
import androidx.activity.enableEdgeToEdge  
import androidx.appcompat.app.AppCompatActivity  
import androidx.core.view.ViewCompat
```

```
import androidx.core.view.WindowInsetsCompat
```

```
class RoadSafetyActivity : AppCompatActivity() {  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        enableEdgeToEdge()  
        setContentView(R.layout.activity_road_safety)  
  
    }  
}
```

Working snapshot



9. Incident Adapter

Kt code

```
package com.example.saferoads

import android.content.Context
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.*
import org.json.JSONArray
import org.json.JSONObject

class IncidentAdapter(private val context: Context, private val incidentList:
    MutableList<IncidentReport>) :
    ArrayAdapter<IncidentReport>(context, 0, incidentList) {

    override fun getView(position: Int, convertView: View?, parent:
        ViewGroup): View {
        val view = convertView ?: LayoutInflater.from(context)
            .inflate(R.layout.item_incident_report, parent, false)

        val incident = incidentList[position]

        val dateText = view.findViewById<TextView>(R.id.incidentDate)
        val timeText = view.findViewById<TextView>(R.id.incidentTime)
        val placeText = view.findViewById<TextView>(R.id.incidentPlace)
        val injuriesText = view.findViewById<TextView>(R.id.incidentInjuries)
        val deleteButton = view.findViewById<Button>(R.id.deleteButton)
        val editButton = view.findViewById<Button>(R.id.editButton)

        // Set text for the incident details (Date, Time, Place, Injuries)
        dateText.text = "Date: ${incident.date}"
        timeText.text = "Time: ${incident.time}"
        placeText.text = "Place: ${incident.place}"
        injuriesText.text = "Injuries: ${incident.injuries}"

        // Handle delete action
        deleteButton.setOnClickListener {
            deleteReport(position)
        }

        // Handle edit action
    }
}
```

```

        editButton.setOnClickListener {
            editReport(incident)
        }

        return view
    }

// Function to delete a report from the list and update SharedPreferences
private fun deleteReport(position: Int) {
    incidentList.removeAt(position)
    notifyDataSetChanged()

    // Update SharedPreferences with the modified list
    val sharedPrefs = context.getSharedPreferences("AccidentPrefs",
Context.MODE_PRIVATE)
    val reportList = JSONArray()
    incidentList.forEach { incident ->
        val report = JSONObject()
        report.put("date", incident.date)
        report.put("time", incident.time)
        report.put("place", incident.place)
        report.put("injuries", incident.injuries)
        report.put("imageUri", "") // No image data anymore
        reportList.put(report)
    }
    sharedPrefs.edit().putString("report_list", reportList.toString()).apply()
}

// Function to edit a report (you can customize the edit flow as needed)
private fun editReport(incident: IncidentReport) {
    // For now, we just show the data in a Toast (you can implement the actual
    // editing UI here)
    Toast.makeText(context, "Edit Report: ${incident.place}",
Toast.LENGTH_SHORT).show()
}
}

```

10. Incident Report

Kt code

```
package com.example.saferoads
```

```
data class IncidentReport(
```

```
    val date: String,  
    val time: String,  
    val place: String,  
    val injuries: String  
    // Removed the imageUri property since image uploading is no longer  
    required  
)
```

11. ReportedIncidents Activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    android:orientation="vertical"  
    android:padding="16dp">  
  
<!-- ListView to display incidents -->  
<ListView  
    android:layout_marginTop="20dp"  
    android:id="@+id/incidentsListView"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    android:divider="@android:color/darker_gray"  
    android:dividerHeight="1dp"  
    android:footerDividersEnabled="false" />  
</LinearLayout>
```

Kt code for ReportedIncidents Activity

```
package com.example.saferoads
```

```
import android.content.Context  
import android.os.Bundle  
import android.widget.Button  
import android.widget.ListView  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity  
import org.json.JSONArray  
import org.json.JSONObject
```

```
class ReportedIncidentsActivity : AppCompatActivity() {
```

```
private lateinit var adapter: IncidentAdapter
private lateinit var incidents: MutableList<IncidentReport>

override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_reported_incidents)

    val listView = findViewById<ListView>(R.id.incidentsListView)
    incidents = loadIncidents()

    // Set up the adapter to display the incidents
    adapter = IncidentAdapter(this, incidents)
    listView.adapter = adapter
}

// Removed file picker logic as it's no longer necessary
// Instead of picking an image, we now add a new incident without image
URI
private fun addNewIncident() {
    val newIncident = IncidentReport(
        date = "2025-04-23", // You can use actual date
        time = "14:00", // You can use actual time
        place = "Someplace", // You can use actual place
        injuries = "None" // You can use actual injury info
        // imageUri is no longer needed
    )

    incidents.add(newIncident)
    adapter.notifyDataSetChanged() // Notify the adapter that the data has
changed

    // Save the new list to SharedPreferences
    saveIncidents()
}

// Load incidents from SharedPreferences (without image URI)
private fun loadIncidents(): MutableList<IncidentReport> {
    val sharedPrefs = getSharedPreferences("AccidentPrefs",
    Context.MODE_PRIVATE)
    val reportList = JSONArray(sharedPrefs.getString("report_list", "[]"))
```

```

val incidents = mutableListOf<IncidentReport>()

// Iterate through the JSON array and convert it to IncidentReport objects
for (i in 0 until reportList.length()) {
    val report = reportList.getJSONObject(i)
    incidents.add(
        IncidentReport(
            date = report.getString("date"),
            time = report.getString("time"),
            place = report.getString("place"),
            injuries = report.getString("injuries")
            // imageUri is no longer required
        )
    )
}
return incidents
}

// Save the list of incidents to SharedPreferences (without image URI)
private fun saveIncidents() {
    val sharedPrefs = getSharedPreferences("AccidentPrefs",
    Context.MODE_PRIVATE)
    val reportList = JSONArray()

    // Convert the list of incidents to a JSON array without imageUri
    incidents.forEach { incident ->
        val report = JSONObject()
        report.put("date", incident.date)
        report.put("time", incident.time)
        report.put("place", incident.place)
        report.put("injuries", incident.injuries)
        // Do not include imageUri
        reportList.put(report)
    }

    // Save the JSON array as a string in SharedPreferences
    sharedPrefs.edit().putString("report_list", reportList.toString()).apply()
}
}

```

12. item_report_activity

xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:padding="12dp"
    android:background="@android:color/white"
    android:elevation="4dp"
    android:layout_marginBottom="8dp"
    android:layout_marginTop="60dp">

    <!-- Incident Date -->
    <TextView
        android:id="@+id/incidentDate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Date"
        android:textStyle="bold"
        android:layout_marginTop="8dp" />

    <!-- Incident Time -->
    <TextView
        android:id="@+id/incidentTime"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Time" />

    <!-- Incident Place -->
    <TextView
        android:id="@+id/incidentPlace"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Place" />

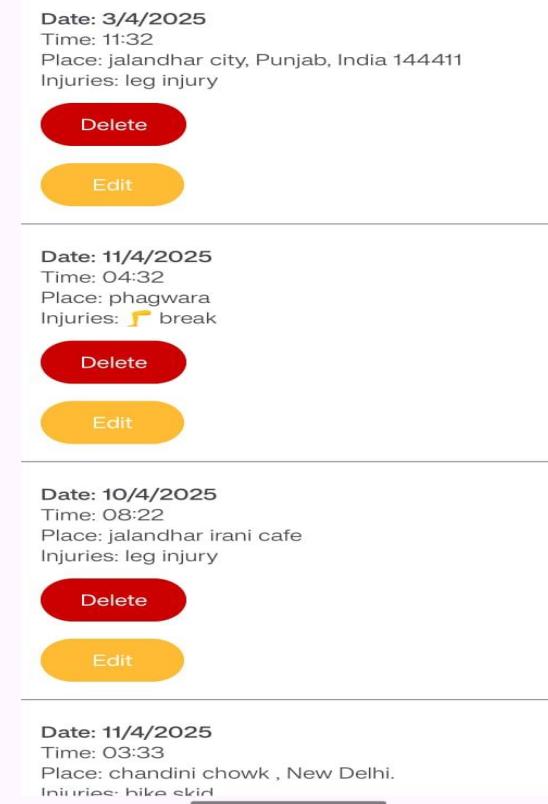
    <!-- Incident Injuries -->
    <TextView
        android:id="@+id/incidentInjuries"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Injuries" />
```

```
<!-- Delete Button -->
<Button
    android:id="@+id/deleteButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Delete"
    android:backgroundTint="@android:color/holo_red_dark"
    android:textColor="@android:color/white"
    android:layout_marginTop="8dp" />

<!-- Edit Button -->
<Button
    android:id="@+id/editButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Edit"
    android:backgroundTint="@android:color/holo_orange_light"
    android:textColor="@android:color/white"
    android:layout_marginTop="8dp" />

</LinearLayout>
```

Working Snapshot



13. EmergencyContacts Activity

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:scrollbars="vertical">

    <!-- Emergency Contacts Button -->
    <Button
        android:layout_marginTop="30dp"
        android:id="@+id/emergencyContactsButton"
        android:layout_width="320dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginBottom="16dp"
        android:background="@color/material_dynamic_primary0"
        android:text="View Emergency Contacts"
        android:textColor="@android:color/white" />

    <!-- Police Contact Card -->
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        app:cardCornerRadius="12dp"
        app:cardElevation="8dp"
        app:drawableTint="@android:color/white">

        <TextView
            android:id="@+id/policeContact"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:background="@color/green"
            android:contentDescription="Dial Police"
            android:gravity="center_vertical"
            android:padding="16dp"
            android:text="Police: 100"
            android:textColor="@android:color/black"
```

```
        android:textSize="18sp" />
    </androidx.cardview.widget.CardView>

    <!-- Fire Contact Card -->
<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp"
    app:cardCornerRadius="12dp"
    app:cardElevation="8dp"
    app:drawableTint="@android:color/white">

    <TextView
        android:id="@+id/fireContact"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="@color/green"
        android:contentDescription="Dial Fire"
        android:padding="16dp"
        android:text="Fire: 101"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        android:gravity="center_vertical"
        app:drawableTint="@android:color/white" />
    </androidx.cardview.widget.CardView>

    <!-- Ambulance Contact Card -->
<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp"
    app:cardCornerRadius="12dp"
    app:cardElevation="8dp"
    app:drawableTint="@android:color/white">

    <TextView
        android:id="@+id/ambulanceContact"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="@color/green"
        android:contentDescription="Dial Ambulance"
        android:padding="16dp"
```

```
        android:text="Ambulance: 102"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        android:gravity="center_vertical"
        app:drawableTint="@android:color/white" />
    </androidx.cardview.widget.CardView>

    <!-- Tourist Helpline Contact Card -->
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        app:cardCornerRadius="12dp"
        app:cardElevation="8dp">

        <TextView
            android:id="@+id/touristHelplineContact"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:background="@color/green"
            android:contentDescription="Dial Tourist Helpline"
            android:padding="16dp"
            android:text="Tourist Helpline: 1363"
            android:textColor="@android:color/black"
            android:textSize="18sp"
            android:gravity="center_vertical"
            app:drawableTint="@android:color/white" />
    </androidx.cardview.widget.CardView>

    <!-- Road Accident Contact Card -->
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        app:cardCornerRadius="12dp"
        app:cardElevation="8dp"
        app:drawableTint="@android:color/white">

        <TextView
            android:id="@+id/roadAccidentContact"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
```

```

        android:background="@color/green"
        android:contentDescription="Dial Road Accident"
        android:padding="16dp"
        android:text="Road Accident: 1073"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        android:gravity="center_vertical"
        app:drawableTint="@android:color/white" />
    </androidx.cardview.widget.CardView>

<!-- Medical Helpline Contact Card -->
<androidx.cardview.widget.CardView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp"
    app:cardCornerRadius="12dp"
    app:cardElevation="8dp"
    app:drawableTint="@android:color/white">

    <TextView
        android:id="@+id/medicalHelplineContact"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="@color/green"
        android:contentDescription="Dial Medical Helpline"
        android:padding="16dp"
        android:text="Medical Helpline: 104"
        android:textColor="@android:color/black"
        android:textSize="18sp"
        android:gravity="center_vertical"
        app:drawableTint="@android:color/white" />
    </androidx.cardview.widget.CardView>

</LinearLayout>

```

Kt code for EmergencyContacts Activity

package com.example.saferoads

```

import android.content.Intent
import android.net.Uri
import android.os.Bundle
import android.widget.Button

```

```
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity

class EmergencyContactsActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_emergency_contacts)

        // Handle click event for Police Contact
        val policeContact = findViewById<TextView>(R.id.policeContact)
        policeContact.setOnClickListener {
            dialEmergencyNumber("100") // Police number
        }

        // Handle click event for Fire Contact
        val fireContact = findViewById<TextView>(R.id.fireContact)
        fireContact.setOnClickListener {
            dialEmergencyNumber("101") // Fire number
        }

        // Handle click event for Ambulance Contact
        val ambulanceContact =
            findViewById<TextView>(R.id.ambulanceContact)
        ambulanceContact.setOnClickListener {
            dialEmergencyNumber("102") // Ambulance number
        }

        // Handle click event for Tourist Helpline Contact
        val touristHelplineContact =
            findViewById<TextView>(R.id.touristHelplineContact)
        touristHelplineContact.setOnClickListener {
            dialEmergencyNumber("1363") // Tourist helpline number
        }

        // Handle click event for Road Accident Contact
        val roadAccidentContact =
            findViewById<TextView>(R.id.roadAccidentContact)
        roadAccidentContact.setOnClickListener {
            dialEmergencyNumber("1073") // Road accident number
        }
    }
}
```

```

// Handle click event for Medical Helpline Contact
val medicalHelplineContact =
findViewById<TextView>(R.id.medicalHelplineContact)
medicalHelplineContact.setOnClickListener {
    dialEmergencyNumber("104") // Medical helpline number
}

// Helper function to dial the emergency number
private fun dialEmergencyNumber(phoneNumber: String) {
    val intent = Intent(Intent.ACTION_DIAL,
Uri.parse("tel:$phoneNumber"))
    startActivity(intent)
}

```

Working Snapshot



14. Profile Activity

Xml code

```

<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:padding="16dp">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Profile"
        android:textSize="30sp"
        android:textStyle="bold"
        android:layout_marginBottom="8dp" />

    <!-- Username Field -->

    <TextView
        android:layout_marginTop="20dp"
        android:id="@+id/textUsername"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Username"
        android:textSize="18sp"
        android:textStyle="bold"
        android:layout_marginBottom="8dp" />

    <EditText
        android:id="@+id/editUsername"
        android:layout_width="320dp"
        android:layout_height="48dp"
        android:hint="Enter your username"
        android:textSize="16sp"
        android:layout_marginBottom="16dp"
        android:focusable="false"
        android:clickable="false"/>

    <!-- Email Field -->
    <TextView
        android:id="@+id/textEmail"
        android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
    android:text="Email"
    android:textSize="18sp"
    android:textStyle="bold"
    android:layout_marginBottom="8dp" />
```

```
<EditText
    android:id="@+id/editEmail"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:hint="Enter your email"
    android:textSize="16sp"
    android:layout_marginBottom="16dp"
    android:focusable="false"
    android:clickable="false"/>
```

```
<!-- Phone Field -->
<TextView
    android:id="@+id/textPhone"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Phone Number"
    android:textSize="18sp"
    android:textStyle="bold"
    android:layout_marginBottom="8dp" />
```

```
<EditText
    android:id="@+id/editPhone"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:hint="Enter your phone number"
    android:textSize="16sp"
    android:layout_marginBottom="16dp"
    android:focusable="false"
    android:clickable="false"/>
```

```
<!-- Address Field -->
<TextView
    android:id="@+id/textAddress"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Address"
```

```
    android:textSize="18sp"
    android:textStyle="bold"
    android:layout_marginBottom="8dp" />

<EditText
    android:id="@+id/editAddress"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:hint="Enter your address"
    android:textSize="16sp"
    android:layout_marginBottom="16dp"
    android:focusable="false"
    android:clickable="false"/>

<!-- Password Field -->
<TextView
    android:id="@+id/textPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Password"
    android:textSize="18sp"
    android:textStyle="bold"
    android:layout_marginBottom="8dp" />

<EditText
    android:id="@+id/editPassword"
    android:layout_width="320dp"
    android:layout_height="48dp"
    android:hint="Enter your password"
    android:textSize="16sp"
    android:layout_marginBottom="16dp"
    android:focusable="false"
    android:clickable="false"/>

<!-- Edit and Save Buttons -->
<Button
    android:id="@+id/btnEditProfile"
    android:layout_width="310dp"
    android:layout_height="wrap_content"
    android:text="Edit Profile"
    android:layout_marginTop="16dp" />
```

```
<Button  
    android:id="@+id	btnSaveProfile"  
    android:layout_width="310dp"  
    android:layout_height="wrap_content"  
    android:text="Save Profile"  
    android:layout_marginTop="16dp" />  
</LinearLayout>  
</ScrollView>
```

Kt code for Profile Activity

```
package com.example.saferoads
```

```
import android.os.Bundle  
import android.widget.Button  
import android.widget.EditText  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity  
  
class ProfileActivity : AppCompatActivity() {  
  
    private lateinit var editUsername: EditText  
    private lateinit var editEmail: EditText  
    private lateinit var editPhone: EditText  
    private lateinit var editAddress: EditText  
    private lateinit var editPassword: EditText  
    private lateinit var btnEditProfile: Button  
    private lateinit var btnSaveProfile: Button  
  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.activity_profile)  
  
        // Initialize Views  
        editUsername = findViewById(R.id.editUsername)  
        editEmail = findViewById(R.id.editEmail)  
        editPhone = findViewById(R.id.editPhone)  
        editAddress = findViewById(R.id.editAddress)  
        editPassword = findViewById(R.id.editPassword)  
        btnEditProfile = findViewById(R.id.btnEditProfile)  
        btnSaveProfile = findViewById(R.id.btnSaveProfile)  
  
        // Get the saved user data from SharedPreferences
```

```
val user = SharedPrefHelper.getUser(this)

// Set user data in the EditText fields
editUsername.setText(user.username)
editEmail.setText(user.email)
editPhone.setText(user.phone)
editAddress.setText(user.address)
editPassword.setText(user.password)

// Disable the fields initially (read-only mode)
disableFields()

// Edit Profile button action (make fields editable)
btnEditProfile.setOnClickListener {
    enableFields()
    btnEditProfile.isEnabled = false // Disable the Edit button after editing
}

// Save Profile button action (save the updated profile information)
btnSaveProfile.setOnClickListener {
    val updatedUsername = editUsername.text.toString()
    val updatedEmail = editEmail.text.toString()
    val updatedPhone = editPhone.text.toString()
    val updatedAddress = editAddress.text.toString()
    val updatedPassword = editPassword.text.toString()

    // Save the updated profile information back to SharedPreferences
    SharedPrefHelper.saveUser(this, updatedUsername, updatedEmail,
updatedPhone, updatedAddress, updatedPassword)

    Toast.makeText(this, "Profile updated successfully",
Toast.LENGTH_SHORT).show()
    disableFields() // Disable the fields again after saving
    btnEditProfile.isEnabled = true // Re-enable the Edit button
}

// Function to enable fields (edit mode)
private fun enableFields() {
    editUsername.isFocusableInTouchMode = true
    editEmail.isFocusableInTouchMode = true
    editPhone.isFocusableInTouchMode = true
```

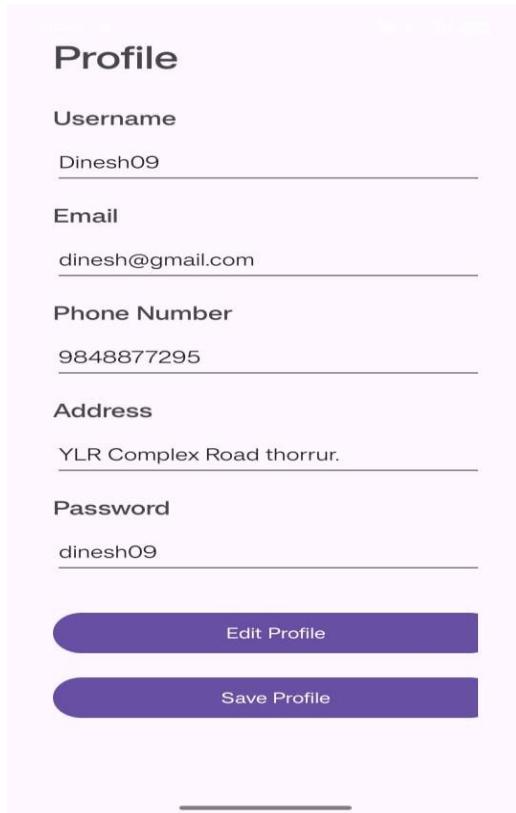
```

        editAddress.isFocusableInTouchMode = true
        editPassword.isFocusableInTouchMode = true
    }

// Function to disable fields (view mode)
private fun disableFields() {
    editUsername.isFocusableInTouchMode = false
    editEmail.isFocusableInTouchMode = false
    editPhone.isFocusableInTouchMode = false
    editAddress.isFocusableInTouchMode = false
    editPassword.isFocusableInTouchMode = false
}
}

```

Working snapshot



15. Settings Activity

Xml code

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">

```

```
<!-- Title -->
<TextView
    android:layout_marginTop="30dp"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Settings"
    android:textSize="24sp"
    android:textStyle="bold"
    android:layout_marginBottom="20dp" />

<!-- Change Theme Section -->
<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Change Theme"
    android:textSize="18sp"
    android:textStyle="bold"
    android:layout_marginBottom="8dp" />

<RadioGroup
    android:id="@+id/themeRadioGroup"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_marginBottom="16dp">

    <!-- Light Theme Option -->
    <RadioButton
        android:id="@+id/radioLightTheme"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Light"
        android:checked="true" />

    <!-- Dark Theme Option -->
    <RadioButton
        android:id="@+id/radioDarkTheme"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Dark" />
</RadioGroup>
```

```
<!-- Logout Button -->
<Button
    android:id="@+id	btnLogout"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Logout"
    android:layout_marginTop="20dp" />
</LinearLayout>
```

Kt code for Settings Activity

```
package com.example.saferoads
```

```
import android.content.Intent
import android.os.Bundle
import android.widget.Button
import android.widget.RadioButton
import android.widget.RadioGroup
import androidx.appcompat.app.AppCompatActivity
import androidx.appcompat.app.AppCompatDelegate

class SettingsActivity : AppCompatActivity() {

    private lateinit var themeRadioGroup: RadioGroup
    private lateinit var radioLightTheme: RadioButton
    private lateinit var radioDarkTheme: RadioButton
    private lateinit var btnLogout: Button

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_settings)

        // Initialize the views
        themeRadioGroup = findViewById(R.id.themeRadioGroup)
        radioLightTheme = findViewById(R.id.radioLightTheme)
        radioDarkTheme = findViewById(R.id.radioDarkTheme)
        btnLogout = findViewById(R.id.btnLogout)

        // Check the current theme and set the RadioButtons accordingly
        val currentMode = AppCompatDelegate.getDefaultNightMode()
        if (currentMode == AppCompatDelegate.MODE_NIGHT_NO) {
            radioLightTheme.isChecked = true
        } else if (currentMode == AppCompatDelegate.MODE_NIGHT_YES) {
```

```

radioDarkTheme.isChecked = true
}

// Handle theme change
themeRadioGroup.setOnCheckedChangeListener { _, checkedId ->
    when (checkedId) {
        R.id.radioLightTheme -> {

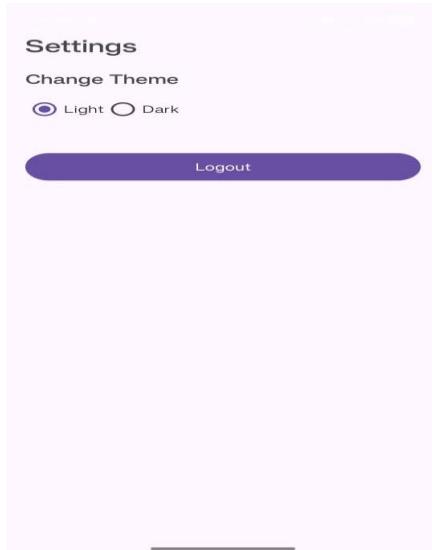
AppCompatDelegate.setDefaultNightMode(AppCompatDelegate.MODE_NIGHT_NO)
    }
        R.id.radioDarkTheme -> {

AppCompatDelegate.setDefaultNightMode(AppCompatDelegate.MODE_NIGHT_YES)
    }
    }
}

// Handle logout action
btnLogout.setOnClickListener {
    // Redirect to login screen without clearing the data
    val intent = Intent(this, LoginActivity::class.java)
    startActivity(intent)
    finish() // Close the settings screen
}
}
}

```

Working Snapshot



16.AndroidManifest.xml code

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.example.saferoads">
    <!-- Required permissions -->
    <uses-permission
        android:name="android.permission.ACCESS_FINE_LOCATION" />
    <uses-permission
        android:name="android.permission.ACCESS_COARSE_LOCATION" />
    <uses-permission android:name="android.permission.INTERNET" />

    <queries>
        <package android:name="com.google.android.apps.maps" />
    </queries>

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.SafeRoads"
        tools:targetApi="33">
        <activity
            android:name=".RoadSafetyActivity"
            android:exported="false" />
        <activity
            android:name=".SettingsActivity"
            android:exported="false" />
        <activity
            android:name=".ProfileActivity"
            android:exported="false" />

        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
```

```

        <category android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
<activity
    android:name=".LoginActivity"
    android:exported="false" />
<activity
    android:name=".SignupActivity"
    android:exported="false" />
<activity
    android:name=".DashboardActivity"
    android:exported="false" />
<activity
    android:name=".AccidentReportActivity"
    android:exported="false" />
<activity
    android:name=".EmergencyContactsActivity"
    android:exported="false" />
<activity
    android:name=".ReportedIncidentsActivity"
    android:exported="false" />
<activity
    android:name=".NavigationActivity"
    android:exported="false" /><!--  Traffic Updates activity -->
<activity
    android:name=".TrafficUpdatesActivity"
    android:exported="false" />
</application>

</manifest>

```

17. Build Gradle file code

```

plugins {
    alias(libs.plugins.android.application)
    alias(libs.plugins.kotlin.android)
}

android {
    namespace = "com.example.saferoads"
    compileSdk = 35
}

```

```
defaultConfig {  
    applicationId = "com.example.mine"  
    minSdk = 24  
    //noinspection OldTargetApi  
    targetSdk = 35  
    versionCode = 1  
    versionName = "1.0"  
  
    testInstrumentationRunner = "androidx.test.runner.AndroidJUnitRunner"  
}  
  
buildTypes {  
    release {  
        isMinifyEnabled = false  
        proguardFiles(  
            getDefaultProguardFile("proguard-android-optimize.txt"),  
            "proguard-rules.pro"  
        )  
    }  
}  
compileOptions {  
    sourceCompatibility = JavaVersion.VERSION_11  
    targetCompatibility = JavaVersion.VERSION_11  
}  
kotlinOptions {  
    jvmTarget = "11"  
}  
}  
  
dependencies {  
  
    implementation(libs.androidx.core.ktx)  
    implementation(libs.androidx.appcompat)  
    implementation(libs.material)  
    implementation(libs.androidx.activity)  
    implementation(libs.androidx.constraintlayout)  
    testImplementation(libs.junit)  
    implementation("com.google.android.gms:play-services-location:21.3.0")  
    androidTestImplementation(libs.androidx.junit)  
    androidTestImplementation(libs.androidx.espresso.core)  
}
```